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Bo Shen

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EXAMINER

DALEY, CLIFTON G

ART UNIT

PAPER NUMBER

2624

NOTIFICATION DATE

DELIVERY MODE

04/30/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/688,082	<b>Applicant(s)</b> SHEN, BO	
	<b>Examiner</b> CLIFTON G. DALEY	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-26 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

This action is Non-Final. Claims 1-26 are currently pending. Applicant's response received on 12/19/2007 is fully considered herein.

### ***Claim Rejections - 35 USC § 101***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Section IV.C, reads as follows:

While abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be. In evaluating whether a claim meets the requirements of section 101, the claim must be considered as a whole to determine whether it is for a particular application of an abstract idea, natural phenomenon, or law of nature, rather than for the abstract idea, natural phenomenon, or law of nature itself.

For claims including such excluded subject matter to be eligible, the claim must be for a practical application of the abstract idea, law of nature, or natural phenomenon. *Diehr*, 450 U.S. at 187, 209 USPQ at 8 ("application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."); *Benson*, 409 U.S. at 71, 175 USPQ at 676 (rejecting formula claim because it "has no substantial practical application").

To satisfy section 101 requirements, the claim must be for a practical application of the Sec. 101 judicial exception, which can be identified in various ways:

The claimed invention "transforms" an article or physical object to a different state or thing.

The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below.

Claim(s) 14-16, 18 and 20 is/are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Each of claims

14-16, 18 and 20 recites the mere manipulation of data or an abstract idea, or merely solves a mathematical problem without a limitation to a practical application. A practical application exists if the result of the claimed invention is "useful, concrete and tangible" (with the emphasis on "result") (Guidelines, section IV.C.2.b). A "useful" result is one that satisfies the utility requirement of section 101, a "concrete" result is one that is "repeatable" or "predictable", and a "tangible" result is one that is "real", or has "real-world" value, as opposed to being "abstract" (Guidelines, section IV.C.2.b)). Each of claims 14-16, 18 and 20 merely manipulates data without ever producing a useful, concrete and tangible result. Each of the instant claims results in a determination of responsiveness. A determination, in and of itself, is not a real-world result.

It is the result that is the focus. If the result has a real world practical application/use, then the test has been satisfied. The claim need not include the uses to which the result is ultimately put, just the result itself. Applicant is advised to provide a written explanation of how and why the claimed invention (either as currently recited or as amended) produces a useful, concrete and tangible result.

**Summary of Applicant's Remarks:** Office Action fails to make a *prima facie* case for lack of utility in accordance with MPEP 2107.02(IV).

**Examiner's Response:** Office Action makes a *prima facie* case for lack of eligibility in accordance with MPEP 2106.IV.C.2.

***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 14-16, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Sorial et al. (Hereinafter "Sorial": Hani Sorial, William E. Lynch and Andre Vincent, "Selective Requantization for transcoding of MPEG Compressed Video", 2000 IEEE, pp. 217-220).

**Regarding claim 14**, Sorial teaches a method for determining responsiveness of a coefficient of a media stream, said method comprising: receiving a plurality of first coefficients and a plurality of second coefficients associated with plurality of blocks of pixels of said media stream, a first quantization step size, a second quantization step size, and a quantization operation ( Section 2, paragraph 2 and Equation 1); performing said quantization operation for a first coefficient of said plurality of first coefficients and a second coefficient of said plurality of second coefficients, said quantization operation based on said first quantization step size and said second quantization step size (Equation 1); and determining whether said first coefficient is responsive based on said quantization operation (Fig. 4b).

**Regarding claim 15**, Sorial teaches the method as recited in claim 14 wherein said quantization operation is a uniform scalar quantizer with rounding to nearest (page 219, right column, second paragraph, i.e. linear mapping, and Equation 1).

**Regarding claim 16**, Sorial teaches the method as recited in claim 14 wherein said quantization operation is a uniform scalar quantizer with rounding down (page 219, right column, second paragraph, i.e. linear mapping, and Equation 1).

**Regarding claim 18**, Sorial teaches the method as recited in claim 14 further comprising repeating said performing and said determining for said plurality of first coefficients (page 218, left column, lines 3-4. i.e. block-by-block basis).

**Regarding claim 20**, Sorial teaches the method as recited in claim 14, wherein said plurality of first coefficients are quantized coefficients and said plurality of second coefficients are transcoded coefficients (page 217, section 2, second paragraph, i.e. quantized input and requantized version (transcoder)).

**Summary of Applicant's Remarks:** Sorial does not teach receiving first coefficients, second coefficients, first quantization step size, second quantization step size, quantization operation and determination of responsiveness based on said quantization operation.

**Examiner's Response:** Receiving first coefficients (i.e. DCT coefficients) is inherently disclosed in equation 1. Receiving second coefficient (i.e. requantized coefficient) is inherently disclosed in equation 4. Therefore, it is inherent in Sorial's disclosure that the first coefficient is responsive (i.e. benefits from selective requantization (page 218, section 4, paragraph 1)) based on the quantization operation. The original 102(b) rejections are maintained.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-5 and 9-11 rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. (hereinafter "Seo"; US 6208688) in view of Triantafyllidis et al (hereinafter "Triantafyllidis"; G. A. Triantafyllidis, D. Tzovaras and M.G. Strintzis, "BLOCKING ARTIFACT REDUCTION IN FREQUENCY DOMAIN", 2001 IEEE, pp. 269-722).

**Regarding claim 1**, Seo teaches a method for deblocking and transcoding a media stream, said method comprising: receiving a coefficient associated with a block of pixels of said media stream (Fig. 1, output of Dequantizer 12).

Seo does not teach performing a deblocking operation on said coefficient to generate a second coefficient.

However, Triantafyllidis discloses a deblocking operation performed on DCT coefficients (i.e. output of Dequantizer).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform Triantafyllidis' deblocking operation on Seo's coefficient in order to reduce blocking artifacts caused by quantization (Triantafyllidis: page 269, section 1, paragraph 1, line 11 to paragraph 2, line 2).

Seo combined with Triantafyllidis teaches performing a deblocking operation on said coefficient to generate a second coefficient (Triantafyllidis: page 271, equations 24 and 25); and

performing quantization on said second coefficient to generate a transcoded coefficient (Seo: Fig. 1, Requantizer 13).

**Regarding claim 2**, Seo combined with Triantafyllidis teaches the method as recited in claim 1 wherein said coefficient is a quantized coefficient (Seo: Fig. 1, input to Dequantizer 12).

**Regarding claims 3 and 9**, Seo combined with Triantafyllidis teaches the method and analogous apparatus (deblocking-capable transcoder) as recited in claim 2 wherein said receiving said coefficient comprises: receiving said quantized coefficient from a pre-encoded bit stream (Fig. 1, input to dequantizer 12); performing inverse quantization on said quantized coefficient to generate a first dequantized coefficient, said inverse quantization having a first step size (Seo: column 3, lines 18-20).

**Regarding claims 4 and 10**, Seo combined with Triantafyllidis teaches the method and analogous apparatus as recited in claim 3 wherein said quantization has a second step size, wherein said second step size is greater than said first step size (Seo: column 3, lines 20-22, and lines 48-53).

**Regarding claim 5**, Seo combined with Triantafyllidis teaches the method as recited in claim 2 wherein said quantized coefficient is a discrete cosine transform (DCT) coefficient (Seo: column 4, lines 54-58).



**Regarding claim 11**, Seo combined with Triantafyllidis teaches the deblocking-capable transcoder as recited in claim 9 wherein said quantized coefficient is a discrete cosine transform (DCT) coefficient (Seo: column 3, lines 13-19).

**Summary of Applicant's Remarks:** Seo does not teach deblocking a coefficient associated with a block of pixels from a media stream.

**Examiner's Response:** Seo combined with Triantafyllidis teaches deblocking a coefficient associated with a block of pixels from a media stream. The original 102(b) rejections are withdrawn and alternate 103(a) rejections are provided above.

6. **Claims 6 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo combined with Triantafyllidis as applied to claim 4 above, and further in view of Sorial.

Seo combined with Triantafyllidis teaches the method and analogous apparatus as recited in claim 4.

Seo combined with Triantafyllidis does not teach the limitation wherein said performing said deblocking operation comprises: determining whether said first dequantized coefficient is responsive; if said first dequantized coefficient is responsive, deblocking said first dequantized coefficient such that said second coefficient is a deblocked coefficient; and if said first dequantized coefficient is not responsive, said second coefficient is said first dequantized coefficient.

However, Sorial teaches a method of determining whether said first dequantized coefficient is responsive (Fig. 4b); and if said first dequantized coefficient is not responsive, said second coefficient is said first dequantized coefficient (Fig. 4a).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Sorial's determination of responsiveness in the Seo/Triantafyllidis transcoding process, the motivation being to reduce Requantization errors (Sorial: Abstract, lines 2-3).

Sorial does not teach the limitation wherein if said first dequantized coefficient is responsive, deblocking said first dequantized coefficient such that said second coefficient is a deblocked coefficient.

However, Triantafyllidis teaches a method of deblocking said first dequantized coefficient such that said second coefficient is a deblocked coefficient (Introduction, second paragraph).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Triantafyllidis' deblocking method in the transcoding process of Seo combined with Sorial, the motivation being to reduce blocking artifacts (Triantafyllidis: Conclusions, lines 3-4).

**Summary of Applicant's Remarks:** Seo, Sorial and Triantafyllidis do not teach "determining whether said first coefficient is responsive". The combination of Seo, Sorial and Triantafyllidis do not support a prima-facie case of obviousness.

**Examiner's Response:** Triantafyllidis teaches a deblocking operation as disclosed in the new rejection to claim 1 above. Furthermore, Triantafyllidis discloses that the deblocked coefficient is between the upper and lower quantization limits (page 271, equation 25). Sorial teaches "determining whether said first coefficient is responsive", as disclosed above. Sorial's responsiveness test (Fig. 4a) discloses that if the upper and lower limits of the first quantizer fall within the upper and lower limits of the second quantizer, then the cascaded quantization (i.e. transcoding) yields the same result as direct quantization. Since the Triantafyllidis deblocked coefficient is always between the upper and lower quantization limits, it would be obvious to one of ordinary skill in the art that in the case of Sorial's Fig. 4a the Triantafyllidis deblocking operation would produce no difference (i.e. non-responsive coefficient) after the second quantization step and would therefore not need to be performed. The original 103(a) rejection is withdrawn and a new 103(a) rejection is provided above.

7. **Claims 7 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo combined with Triantafyllidis and Sorial as applied to claim 6 above, and further in view of Mine (US 6987808).

Seo combined with Triantafyllidis and Sorial teaches the method and analogous apparatus as recited in claim 6.

Seo combined with Triantafyllidis and Sorial does not teach the limitation wherein said determining whether said first dequantized coefficient is responsive comprises:

accessing a table based on said first step size, said table comprising a distribution of at least one responsive coefficient based on said second step size; and determining whether said first dequantized coefficient at said second step size is responsive.

However, Mine discloses the use of a table in a transcoding process (column 2, lines 13-20).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a table in the transcoding process of Seo combined with Triantafyllidis and Sorial, the motivation being to improve computation efficiency.

**Summary of Applicant's Remarks:** Seo, Sorial and Triantafyllidis do not teach "determining whether said first coefficient is responsive". The combination of Seo, Sorial and Triantafyllidis does not support a prima-facie case of obviousness. That which is missing from the combination of Seo, Sorial and Triantafyllidis is not taught by Mine.

**Examiner's Response:** Triantafyllidis teaches a deblocking operation and Sorial teaches "determining whether said first coefficient is responsive", as disclosed in the rejection of claim 6 above. The original 103(a) rejection is withdrawn and a new 103(a) rejection is provided above.

8. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Seo combined with Triantafyllidis as applied to claim 4 above, and further in view of Hanamura et al. (Hereinafter "Hanamura": US 6587508).

Seo combined with Triantafyllidis teaches the method as recited in claim 4.

Seo combined with Triantafyllidis does not teach the limitation to the method further comprising determining an optimal value for said second step size based on quantization error for said quantized coefficient.

However Hanamura discloses a method comprising determining an optimal value for said second step size (i.e. re-quantization parameter) based on quantization error for said quantized coefficient (column 33, line 65 to column 34, line 5).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Hanamura's optimization method with Seo's teaching, the motivation being to stabilize rate control in transcoding (Hanamura: column 11, lines 14-15).

**Summary of Applicant's Remarks:** Seo combined with Hanamura does not teach the limitations of claim 1.

**Examiner's Response:** Seo combined with Triantafyllidis teaches the limitations of claim 1 as disclosed in the new rejection of claim 1 above. The original 103(a) rejection is withdrawn and a new 103(a) rejection is provided above.

9. Claims 19 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorial in view of Mine.

**Regarding claim 19,** Sorial teaches the method as recited in claim 18.

Sorial does not teach the limitation further comprising generating a coefficient responsiveness table comprising a distribution of responsiveness of said plurality of first

coefficients for said first quantization step size, wherein a first axis corresponds to said plurality of first coefficients and said second axis corresponds to said second quantization step size.

However, Mine discloses the use of a table in a transcoding process (column 2, lines 13-20).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a table in Sorial's transcoding process, the motivation being to improve computation efficiency.

**Regarding claim 21**, Sorial teaches a method for determining an optimal quantization step size, said method comprising: receiving an input quantization step size and a plurality of coefficients of a macroblock (page 219, right column, lines 8-9, i.e. CBR transcoding of MPEG-2 compressed video); determining a plurality of candidate quantization step sizes (page 219, right column, see algorithms for intra macroblock and non-intra macroblock); and determining said optimal quantization step size from said plurality of quantization step sizes based on a second table (page 219, right column, see algorithms for intra macroblock and non-intra macroblock).

Sorial does not teach the use of a first and second table for determining candidate step sizes and optimal step size respectively.

However, Mine discloses the use of a table in a transcoding process (column 2, lines 13-20).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use tables in Sorial's transcoding process, the motivation being to improve computation efficiency.

Sorial does not teach the limitation of determining a magnitude distribution of non-zero coefficients of said plurality of coefficients.

However, Mine discloses determining a magnitude distribution of non-zero coefficients of said plurality of coefficients (column 10, lines 52-54).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine a magnitude distribution of non-zero coefficients of said plurality of coefficients in Sorial's transcoding process, the motivation being to detect the presence or absence of edges (Mine: column 10, lines 55-56).

**Regarding claim 22**, Sorial in combination with Mine teaches the method as recited in claim 21 wherein said first table is a quantization error table (Sorial: page 218, section 4, lines 2-4).

**Regarding claim 23**, Sorial in combination with Mine teaches the method as recited in claim 21 wherein said second table is a coefficient responsiveness table Sorial: page 219, after algorithms, with line 1 starting "where the above ...", lines 7-8, i.e. not responsive, and lines 8-10, i.e. responsive).

**Summary of Applicant's Remarks:** Claim 19 is dependent on claim 14. Sorial and Mine do not show or suggest the limitations of claim 14, in particular, "determining

whether said first coefficient is responsive". Sorial combined with Mine does not teach the additional claimed features of claims 19, 22 and 23. Claim 21 includes a similar embodiment to claim 14.

**Examiner's Response:** Regarding claim 19, Sorial teaches the limitations of claim 14 (see rejection of claim 14 above and corresponding Examiner's response). Regarding claim 21, the recited limitations do not include "determining whether said first coefficient is responsive". That which is missing from Sorial in claims 19, 22 and 23 is taught by Mine as disclosed above. The original 103(a) rejections are maintained.

### ***Allowable Subject Matter***

10. **Claim 17** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The recited method of determining responsiveness based on an upper and a lower bound is not found in the prior art of record.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLIFTON G. DALEY whose telephone number is 571-270-3144. The examiner can normally be reached on Monday - Friday 7:30am - 4:00pm.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Samir Ahmed  
Examiner  
Art Unit 2624

CGD  
4/21/2008

/Samir A. Ahmed/  
Supervisory Patent Examiner, Art Unit 2624